UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/558,445	11/06/2006	Pamela Whitfield	11495-1	6120

25277 7590 06/27/2008

NATIONAL RESEARCH COUNCIL OF CANADA
1200 MONTREAL ROAD
BLDG M-58, ROOM EG12
OTTAWA, ONTARIO, K1A 0R6
CANADA

EXAMINER	
ARCIERO, ADAM A	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
06/27/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/558,445	WHITFIELD ET AL.	
	Examiner	Art Unit	
	ADAM A. ARCIERO	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/17/2007 and 03/14/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Amendment filed 03/14/2008 has been entered and fully considered. Claims 1-9, and 11-17 remain pending in the application. Claim 10 has been canceled. Claims 11-17 are newly presented. The 35 USC 102(b)/103(a) rejections of claims 1-10, based on KAZUHARA et al. as the primary reference in the previous office action are withdrawn in light of Applicant's amendments to the claims. Claims 1-3, 6 and 8 have been amended. Claims 1-9 and 11-17 are finally rejected for the reasons given below that are necessitated by applicant's amendment to the claims.

2. The affidavit under 37 CFR 1.132 filed on 03/14/2008 has been considered by the Examiner. Tables 2 and 3 of the instant specification do not support Applicant's arguments for the claim 1 structure of "M" as the specific compositions shown in said tables do not generalize "M". Also the Applicant is not entitled to extrapolate from the few specific data points from tables 2 and 3 in order to obtain a general formula. Thus, amended claims 1 and 6 contain new matter.

Priority

3. The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 60/473,476, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. There is lack of support in the prior filed application for the composition of M_z and that M cannot be solely Ni or Cr, for independent claims 1 and 6. Therefore claims 1-9 and 11-17 are not entitled to the benefit of the prior filed application.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-9 and 11-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As to Claims 1 and 6, the Applicant amended the claims so that they read "…$Li_xMn_yM_zO_2$ where $0 < x < 0.24$, $0 < y < 1$, $z = 0.46$-0.86, and $y + z = 0.94$ to 0.99, manganese is in the 4+ oxidation state and M is one or more transition metal or other cations, but is not solely Ni or Cr." The specification does not support the composition containing M_z where $z = 0.46$ to 0.86 or the relationship of $y + z$. Furthermore the specification does not support that M is not solely Cr. This negative limitation is not in the original disclosure. Negative limitations must be

supported by the original disclosure as outlined in MPEP 2173.05(i). Tables 2 and 3 submitted in the affidavit do not support the arguments for the claim 1 structure of "M" as the specific structures do not generalize "M". Also the applicant is not entitled to extrapolate specific data points from tables 1 and 3 to obtain the general formula of claim 1 which was not part of applicant's original disclosure.

As to Claim 13, the specification and especially tables 2 and 3 do not support the limitation of claim 13 wherein M is $Ni_{0.2}Co_{0.18}Cu_{0.4}$.

Claims depending from claims rejected under 35 USC 112 first paragraph are also rejected for the same.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-3, 5-8, 11-12 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over LU et al. (Pub No. US 2003/0027048 A1).

As to Claims 1-3 and 5-8, 11-12 and 14-17, LU et al. discloses a cathode composition for a lithium-ion battery having a single-phase crystal structure (Abstract). LU et al. discloses a starting material of $Li_{1.04}Ni_{0.368}Co_{0.263}Mn_{0.38}O_2$ (pg. 5, [0054]). This material was cycled up to 4.8 volts (pg. 5, [0055]). This starting material corresponds very closely with the starting materials shown in Tables 2 and 3 supplied in the affidavit filed by the applicant as the stoichiometries of the prior art starting materials of Li, Ni, Co and Mn are slightly different than those supplied by the applicant. According to MPEP 2144.05, "a *prima facie* case of obviousness exists where the claimed ranges and the prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)." Therefore, the prior art starting material renders the applicant's starting material obvious. "M" of claims 1 and 6 correspond to the Ni and Co elements found in the prior art composition. LU et al. also discloses that cycles were collected at 30 °C and 55 °C and the capacity of the material was maintained at 55 °C. Therefore, at the time of the invention a person having ordinary skill in the art would have found it obvious that the starting material of LU et al. when cycled up to 4.8 volts would inherently obtain the final composition claimed in claims 1 and 6 after charge/discharge.

9. Claims 4, 9 and 13 rejected under 35 U.S.C. 103(a) as being unpatentable over LU et al. (Pub No. US 2003/0027048 A1) in view of OHZUKU et al. (Pub. No. US 2003/0087154 A1).

As to Claims 4, 9 and 13, the disclosure of LU et al. as discussed above in claims 1, 6 and 12 is incorporated herein. LU et al. does not expressly disclose wherein M is one or more transition metal or other metal cations chosen from the first row transition metals and Al.

However, OHZUKU et al. discloses a lithium-nickel-manganese composite oxide for use as a positive electrode active material in a non-aqueous electrolyte battery (pg. 3, [0057]). The lithium-containing composite oxide is preferable represented by the formula: $Li[M_x(Ni_\delta Mn_\gamma)_{1-x}]O_2$ where M is one or more elements except for Ni and Mn, $-0.1 \leq x \leq 0.3$, $\delta = 0.5 \pm 0.1$, $\gamma = 0.5 \pm 0.1$. The oxidation state of M is preferably trivalent and M preferably contains at least one of aluminum and cobalt (pg. 3, [0041] to [0043]).

At the time of the invention a person having ordinary skill in the art would have found it obvious to dope aluminum into the composition of LU et al. because the electrical potential of said active material is increased along with improved thermal stability by doping aluminum, as taught by OHZUKU et al. (pg. 9, [0140]).

Response to Arguments

10. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection as necessitated by applicant's amendment

to the claims. Applicant argues on page 6 and page 7 that the elevated temperature applied during charging in the manufacturing process plays a critical role in the prior art invention of KAZUHARA et al. and that the prior art teaches away from the low temperature process of amended claim 6. Applicant's argument is persuasive. However, Claims 1 and 6 are being rejected as being obvious over LU et al. Applicant also argues on page 7 that the charging voltage is as low as 4.0 volts which is lover than the claimed range of the applicant's invention. However, these arguments are moot in view of the new grounds of rejection applied with LU et al. to claim 6. Applicant also argues on page 8 that the KAZUHARA et al. prior art is said to be non-crystalline after processing whereas the applicant's invention is to maintain a single-phase layered crystal structure after processing. Applicant's argument is persuasive. However, Claims 1 and 6 are newly rejected as being obvious over LU et al.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam A. Arciero whose telephone number is 571-270-5116. The examiner can normally be reached on Monday through Thursday, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Susy Tsang-Foster/

Supervisory Patent Examiner, Art Unit 1795